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The contemporary height of aeolian accumulative complex Sarykum (republic of Dagestan) and the causes of its change

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Abstract

The aeolian accumulative complex Sarykum is the Russia's largest and one of the highest in Eurasia sandy massif, which formed away from large deserts. It is located in the Terek-Sulak lowland at the foothill of northeastern mega-slope of the Greater Caucasus. Since the end of the 19th century until the present time the highest dune of the complex has reduced in the height more than by 16 m (since the middle of the 20th century - by 5.7 m) - from 262 to 245.8 m. According to the authors, the reduction was caused mainly by natural (first of all by climate) change in the region. So, the average annual number of moderate, strong and very strong winds had here reduced by 41% (from 1966-1986 to 1987-2015), especially at the summer (in the driest period with strongest deflation) and the winter seasons, and the average annual precipitation had increased by 25% between the same periods. The latter fact contributed to wide expansion of grass and shrub vegetation on the slopes of Sarykum and increased a deflation resistance of its sands. In addition, the strong earthquake (May 14, 1970) with the epicenter that located nearby the Sarykum could be the reason of the dune height reduction. Against the background of the natural changes, the potential role of human activities is manifested through the sand quarrying in the early 20th century and the creation of protected (reserve) status within of the Great (West) Sarykum since late 1980s.

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Keywords

Aeolian landforms, Aeolian processes, Climate change, Dagestan, Dune, Earthquake, Height, Natural reserve, Sand, Sarykum

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